Appendix I3

Avian Survey

Technical Report – Part 2 of 4

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Attachment 2

USFWS Section 10(a)(1)(A) Scientific Permit Requirements for Conducting Presence/Absence Surveys for Endangered Golden-cheeked Warblers

USFWS Section 10(a)(1)(A) Scientific Permit Requirements for Conducting Presence/Absence Surveys for Endangered Golden-cheeked Warblers

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This document identifies survey methods to be used for conducting presence/absence surveys for golden-cheeked warblers (*Dendroica chrysoparia*, GCWA) under a section 10(a)(1)(A) scientific research and recovery permit. Also included are GCWA habitat descriptions from Texas Parks and Wildlife Department's Management Guidelines for GCWAs (Campbell 2003). These descriptions include all habitats that the USFWS considers to be potential GCWA habitat, and as such, areas meeting these descriptions should be surveyed in accordance with the protocol below.

1. The following minimum procedures must be used to determine presence/absence.

   - GCWA surveys must be conducted between March 15 and June 1 with 60 percent of the surveys being conducted prior to May 15 (Pulich 1976, Gass 1996, Bolsinger 1997, Ladd and Gass 1999).
   - We recommend survey times start 30 minutes before sunrise (Bolsinger 1997). **All** surveys must be completed within 7 hours of sunrise (Robbins 1981a).
   - Surveys must not be conducted during the following weather conditions: a) wind speeds greater than 12 mph, 2) fog, 3) light to heavy precipitation, and 4) temperatures <45ºF or >80ºF (Robbins 1981b, Verner 1985).
   - Surveyors must not conduct surveys when experiencing temporary hearing impairment, such as from a cold (Emlen and DeJong 1981).
   - A minimum of five visits with no more than 1 visit within any 5-day period. Total survey time should be a minimum of 4 hours per 100 acres of habitat per visit (habitat is defined in number 2 below).
   - A minimum of 1hour per visit is needed regardless of the size of the site.
   - Taped or play back recordings of GCWA or screech owl calls can only be used after the above methodology (5 visits) has been exhausted and no birds have been located in the area. Tapes must be used to verify negative results (absence of target birds). Tapes should be played for only 30 to 60 seconds at any one point, then a quiet period of at least 15 seconds before playing the tapes one more time and moving on. Upon sighting or hearing a GCWA, the tape must be turned off immediately.
   - Exceptions to this methodology may be allowed only through coordination with and prior written approval by the Austin Office of the U.S. Fish and Wildlife Service. Please call 512/ 490-0057 and ask for the GCWA species lead.

2. Potential GCWA habitat (Campbell 2003):

   <u>Habitat Types Where GCWAs Are Expected To Occur</u>

   - Woodlands with mature Ashe juniper (cedar) in a natural mix with oaks, elms, and other hardwoods, in relatively moist (mesic) areas such as steep canyons and slopes, and adjacent uplands are considered habitat types that are highly likely to be used by warblers. Mature Ashe junipers are trees that are at least 15 feet in height with a trunk diameter of about five inches at four feet above the ground (dbh). These areas generally will have a nearly

continuous canopy cover of trees with 50- 100% canopy closure and an overall woodland canopy height of 20 feet or more.

Habitat Types That May Be Used By GCWAs

- There are a number of other vegetation types that may also be used by GCWAs, depending on the location, size of tract, land use, adjacent landscape features, and vegetation structure. These habitat types are most often used by GCWAs when they are located adjacent to or near areas where GCWAs are expected to occur.
    - Stands of mature Ashe juniper (trees with shredding bark), over 15 feet in height and diameter at breast height (dbh) of about 5 inches, with scattered live oaks (at least 10 percent total canopy cover), where the total canopy cover of trees exceeds 35 percent and overall woodland canopy height is at least 20 feet.
    - Bottomlands along creeks and drainages that support at least a 35 percent canopy of deciduous trees (average canopy height of 20 feet), with mature Ashe juniper (at least 15 feet and 5 inches dbh) growing either in the bottom or on nearby slopes.
    - Mixed stands of post oak and/or blackjack oak (10-30 percent canopy cover), with scattered mature Ashe juniper (15 feet in height and 5 inches dbh), where the total canopy cover of trees exceeds 35 percent and overall woodland canopy height is 20 feet.
    - Mixed stands of shin (scalybark) oak (10-30 percent canopy cover) with scattered mature Ashe juniper (15 feet in height and 5 inches dbh), where the total canopy cover of trees exceeds 35 percent and overall woodland canopy height is 20 feet.

Areas Where GCWAs Are Not Expected To Be Found

- The following types of areas are not typical GCWA habitat and are unlikely to be used by GCWAs unless adjacent to GCWA habitat areas. This is important because areas consisting of non-typical GCWA habitat that are adjacent to occupied habitat may in fact be used for foraging. This is especially true for sparsely wooded grassland or low-impact agriculture, but much less so for industrial, commercial, and medium to high density residential areas. Further, although junipers occur abundantly over much of the Hill Country, a relatively small portion of them are actually a part of usable GCWA habitat.
    - Stands of small Ashe juniper, averaging less than 15 feet in height and 5 inches dbh. This includes small juniper that invades open rangelands, previously cleared areas, or old fields. These areas are often dry and relatively flat, and lack oaks and other broad-leaved trees and shrubs. Generally, areas such as those described above that have been cleared within the last 20 years
    - Pure stands of larger (greater than 15 feet in height and 5 inches dbh) Ashe juniper, with few or no oaks or other hardwoods.
    - Open park-like woodlands or savannahs (even with old junipers) where canopy cover of trees is less than 35 percent. These areas often have scattered live oaks and other trees.
    - Small junipers and other trees coming up along existing fence lines.
    - Small junipers (less than 15 feet tall) coming up under larger hardwoods where junipers have been removed in the past 20 years.

3. Reports:

Interim:

a) Go to: http://www.fws.gov/southwest/es/AustinTexas and scroll down to "Golden-cheeked warbler (GCWA) and black-capped vireo (BCVI) reporting for 10(a)(1)(A) Scientific Research and Recovery Permits" for the reporting forms. Surveys conducted according to protocol (those completed by June1) must be submitted no later than June 30th of that same year. Bird detections or surveys not conducted according to protocol must be submitted within 10 business days of completion of the survey.
b) Reports of determinations of non-GCWA habitat where habitat onsite meets one or more of the descriptions above. These reports must be submitted to us within 5 business days of that determination. Each report should include: 1) a map with a clear understanding of the location of that property within the county; 2) an aerial photo with a) the date the photo was taken (no older than 2006) and b) the property boundary; 3) detailed descriptions of the habitat on site; and 4) detailed descriptions of what factors were assessed to make the determination (for example, aerial photographs, Landsat imagery, and/or site visits).

Annual:

It is not necessary to resubmit the data reported under a) above. However, annual reports must include detailed descriptions of all habitats found on all parcels surveyed and submitted under a).

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Attachment 3

GCWA and BCVI Background Information

Golden-cheeked Warbler and Black-capped Vireo Background Information

Golden-cheeck Warbler Description

The golden-cheeked warbler (*Dendroica chrysoparia*) (GCWA) is a small, neo-tropical songbird in the family Parulidae. Male GCWAs have a black back, throat, upper breast, and crown, white belly, black-streaked sides, white wing bars, and a black line through the eye with large yellow patches both above and below the eye. Female and immature GCWAs are duller, with olive upperparts with dark streaks and a yellowish or white chin (http://www.natureserve.org/ infonatura).

GCWA Life History

The GCWA was discovered in Guatemala in 1859 and described in 1860 (Federal Register 55, 53153-53160). The first specimen was collected in 1864 near the confluence of the Medina and San Antonio Rivers in Bexar County, Texas, and the first GCWA nest was found in 1878 in Comal County. The GCWA was federally listed as an endangered species on May 4, 1990, by means of an emergency rule. The final rule listing the GCWA as endangered under the Endangered Species Act (ESA) was published on December 27, 1990 (USFWS 1992). In February 1991, the species was designated as endangered by the State of Texas (USFWS 1992). Critical habitat for the GCWA has not been designated.

The GCWA winters in southern Mexico (State of Chiapas) and in the Central American countries of Guatemala, Honduras, and Nicaragua (USFWS 1992). The species breeds only in the mixed Ashe juniper–oak woodlands of Central Texas. Of all the avian species known to occur in Texas, the GCWA is the only species whose breeding range is completely limited to the state. The GCWA generally begins to arrive on the breeding grounds in central Texas in late February and early March. The migration route of the GCWA follows the coniferous-oak highlands of the Sierra Madre Oriental (http://www.natureserve.org/infonatura). The majority of the adults and fledglings leave the breeding grounds and begin the southward migration back to the subtropics in late June to July.

The GCWA is insectivorous, with beetles, caterpillars, Homopterans, Hemipterans, and spiders being their most common prey items (USFWS 1992). Much of the foraging time of the GCWA is spent gleaning for insects by moving from branch to branch within the upper portions of the woodland canopy (USFWS 1992).

GCWA Population Dynamics

Pulich (1976) considered 31 counties located in Texas to be the nesting range of the GCWA: Bandera, Bell, Bexar, Blanco, Edwards, Erath, Comal, Coryell, Eastland, Bosque, Burnet, Gillespie, Hamilton, Hays, Hood, Johnson, Kendall, Kerr, Kimble, Kinney, Lampasas, Llano, Medina, Palo Pinto, Real, San Saba, Somervell, Stephens, Travis, Uvalde, and Williamson. He estimated the entire GCWA population in 1974 to be between 15,000 and 17,000 individuals (Federal Register 55, 53153-53160). In 1990, suitable habitat for the species was estimated throughout both urban and rural sections of Texas, and based on available breeding habitat, it was determined that Texas could only support 4,800 to 16,000 breeding pairs (Federal Register 55, 53153-53160). It was estimated that only 2,200 to 4,600 remained in 1990 (http://www.natureserve.org/infonatura).

The 2006 range map published by the Texas Parks and Wildlife Department (TPWD) shows the GCWA as having a potential or known presence in 44 counties in Texas. Currently, the USFWS distribution map for the GCWA shows the species as being present in 37 counties in Texas on the Lampasas Cut Plain, the Edwards Plateau, and the Llano Uplift regions of Texas. The largest concentration of GCWAs is located in the Balcones Fault Zone (USFWS 1992). Numerous state and federal properties totaling over 126,000 acres are within the breeding range of the GCWA. These include parks, natural areas, and recreation areas owned by the State of Texas and military reservations, areas surrounding lakes and a national wildlife refuge owned by the federal government (USFWS 1992). Of the 29 properties owned by the state or federal government within the range of the GCWA, 16 have the GCWA present. In addition, other entities such as the Lower Colorado River Authority, counties (Bexar, Travis, Williamson and Hays), and local municipalities also own property occupied by and/or managed for the GCWA (USFWS 1992).

GCWA Habitat

According to the recovery plan, the GCWA inhabits two distinctly different habitat types: a closed-canopy Ashe-juniper woodland in central Texas and a pine-oak woodland in the highlands of southern Mexico to Nicaragua (USFWS 1992). The Ashe juniper-oak woodland is the breeding habitat for the GCWA in Central Texas. The GCWA nests only in climax stage woodlands with a high proportion of mature Ashe juniper trees interspersed with other deciduous species, and prefer areas with a moderate to high tree density with dense foliage in the upper levels (USFWS 1992). According to Ladd and Gass (1999), forest stands where GCWAs are typically found average about 40 years in age and 20 feet in height with about 70 percent canopy cover and a tree density of 400 trees per acre. The mature Ashe juniper is a key habitat feature for the GCWA since the main component in the species' nest is strips of bark from aged juniper trees. The loose, stringy bark found in the species' nest is only observed in older, mature trees, which accounts for the reliance of the GCWA on mature Ashe juniper stands. A study by J.C. Kroll (1980) found that Ashe juniper trees began sloughing bark near the base of the tree by 20 years of age and by the crown at 40 years. A few other factors may contribute to an improved habitat for GCWAs. Ladd (1985) noticed that the suitable habitat for the species coincided with steep canyons or rugged slopes, but nests are not limited to canyons (Guilfoyle 2002). GCWAs may be associated with canyon slopes because of a combination of other factors influencing the habitat quality: 1) greater surface run-off and seepage, which favors growth of preferred tree species and increases arthropod availability, 2) protection from wildfires, or 3) increased protection against the threat of clearing due to the high cost that comes with clearing steep slopes (USFWS 1992).

GCWA Breeding/Reproduction

Depending on the location and quality of habitat, GCWAs forage and nest in areas ranging in size from 5 to 20 acres per pair. Nesting territories range in size from 3 to 6 acres, and males often return to the same nesting territory in subsequent years. Female GCWAs begin building nests the first week of April. The nests consist of bark from the Ashe juniper tree that is secured by cobwebs and lined with feathers, grass, oak leaves, etc. When finished, the nest is a small, compact cup averaging 80 millimeters outside diameter and 50 millimeters outside depth (USFWS 1992). Pulich (1976) found that females usually place the nest in the upper two-thirds of Ashe juniper trees. While juniper trees are the most common tree used as nesting sites, the species has also

been found to place their nests in cedar elms, various oaks, pecans, and other species (USFWS 1992). The female GCWA will perform all duties associated with incubation, which begins on the day before the last egg is laid and lasts 12 days. The female spends at least 75 percent of daylight hours on the nest (USFWS 1992).

Reasons for Listing GCWA and Current Threats

Historically, habitat loss and fragmentation were the major reasons for the decline in the GCWA population. A juniper eradication program was implemented in Texas in 1948, and from the 1950s to the 1970s, about 50 percent of the juniper acreage was cleared for pasture improvement and urbanization (Federal Register). Several counties that had been GCWA habitat, including portions of Gillespie County and all of Mason County, no longer contained suitable habitat by the 1970s (Federal Register). The current threat to the Ashe juniper-oak woodland is urban sprawl, growth of urban areas with known GCWA populations such as the city of Austin, and the conversion of wooded areas to agricultural land. In 1992, 60 percent of the remaining warbler habitat was located in the fastest urbanizing counties of Texas such as Travis, Bexar, and Kerr (Sexton 1992). Because of the growth and development in this corridor, the greatest rate of GCWA habitat loss has occurred in the southern and eastern portions of the Edwards Plateau (Federal Register). According to the GCWA recovery plan other major threats to the species include the creation of impoundments for flood control and livestock, loss of winter and migration habitat, destruction of oaks by oak wilt, over-browsing by livestock and white-tailed deer, nest parasitism, and habitat fragmentation (USFWS 1992).

Black-capped Vireo Description

The black-capped vireo (*Vireo atricafilla*) (BCVI) is one of the smallest vireos, measuring only 12 centimeters. The species is unique among vireos because it is sexually dichromatic and first-year males show delayed plumage maturation. The male BCVI has an olive green back, dark olive to blackish wings with two pale yellow wing bars, white underneath with yellow-tinged flanks, and a black head with white spectacles. Adult females have a gray head, as do the immature males.

BCVI Life History

The BCVI was discovered along the Devil's River in Sutton County, Texas on May 26, 1851 and described in 1852. The BCVI was federally listed as endangered under the ESA on November 5, 1987. The species is also listed as endangered by the State of Texas (USFWS 1991). Critical habitat has not been designated.

The BCVI is a neotropical migrant species that breeds in central Texas, with a few small breeding populations found in Oklahoma. The BCVI winters on the pacific coast of Mexico (States of Durango, Sinoloa, Nayarit, Jalisco, Sonora, Guerrero, and Oaxaca) (USFWS 1991). The BCVI begins arriving on its breeding grounds in Texas from late March to mid-April and leaves Texas to begin the migration south by mid September.

The BCVI is primarily insectivorous during the breeding season, mainly feeding on invertebrates gleaned from leaves and stems found low in the scrub vegetation it inhabits (Guilfoyle 2002). The primary prey items in one study included Lepidopterans, Coleopterans, Homopterans, and Arachnids (Wilkins et al. 2006). The

fall and winter diet includes a wider array of invertebrates as well as fruit and vegetable matter (Wilkins et al. 2006).

BCVI Population Dynamics

The historic range of the BCVI included portions of Kansas, Louisiana, Nebraska, Oklahoma, New Mexico, Texas, and Mexico (USFWS 1991). Currently, the BCVI's breeding range extends from Oklahoma, through central and west Texas, south through the Mexican State of Nuevo Leon and into the southwestern part of Tamaulipas (Wilkins et al. 2006).

Currently, the USFWS distribution map for the BCVI shows the species as being present in five counties in central Oklahoma, although no information was available regarding the population count or distribution in each county. According to the USFWS current news website for the Wichita Mountains Wildlife Refuge, 1,468 BCVI nesting pairs were recorded on the property in 2005, and more than 500 birds were located on Fort Sill Military Reserve.

According to the USFWS recovery plan, there were 34 counties in Texas known to be occupied by breeding BCVI in 1990. Several hundred adults were known to be breeding on the Fort Hood Military Reserve located in Bell and Coryell Counties. This was considered to be the most northern substantial group of BCVIs in Texas. Fewer than 100 BCVI adults were found in the Austin area (Travis County) and 40 to 50 males were located northwest of Austin in the Post Oak Ridge area. About 450 adults were estimated in a sample area in western Kerr County and were thought to be part of a larger population in that area. Eighteen to 26 territories were mapped at Lost Maples State Natural Area in Bandera County. More than 100 males occupied an area that focused on the Kickapoo Caverns State Natural Area in Kinney and Edwards counties. Ninety-three territories were mapped in canyons traversing the upper bend of the Rio Grande and including canyons of the Devil's River in Val Verde County (USFWS 1991). Other counties along the Lampasas Cut Plains, Edwards Plateau, Llano Uplift and Balcones Escarpment also recorded BCVI sightings. From 1985 to 1990, about 1,500 birds were observed in Texas, but population estimates were difficult to derive because of the inconsistent and incomplete sampling and nature of the information. The USFWS recovery plan states that the 1,500 BCVIs observed in Texas probably only corresponded to about 620 breeding pairs (USFWS 1991).

In 2004, the largest breeding population of the BCVI under a single management authority occurred on the Fort Hood Military Reservation (Cimprich and Kostecke 2006). A foot survey performed in 2002 and 2003 on the Fort Hood property mapped 6,971 hectares of potential habitat and detected 1,846 male vireos. In 2005, the Chalk Mountain Wildlife Management Association located in Bosque, Erath, Hood, and Somervell Counties was awarded a private stewardship grant from the USFWS to restore 1,750 acres of habitat for the BCVI and the GCWA. The Chalk Mountain Wildlife Management Association is a group of private landowners who have come together to collectively manage their properties, which together total more than 60,000 acres. One entity belonging to the association is Quail Ridge Ranch, which is located southwest of Glen Rose. According to the Quail Ridge Ranch website, BCVIs are present on the property but the numbers are estimated to be fewer than 20 individuals.

Another population of BCVI is located in the Balcones Canyonlands Preserve and Balcones Canyonland National Wildlife Refuge (NWR) in Austin, Texas. As of August 2006, the City of Austin, Travis County, and other groups such as the Nature Conservancy have purchased about 28,000 acres of BCVI and GCWA habitat as part of the Balcones Canyonlands Preserve. Population of BCVIs in the Balcones Canyonlands Preserve and NWR were estimated to be 114 territories (Wilkins et al. 2006). At the Kerr Wildlife Management Area, surveys of singing males show claimed territories have grown from 27 in 1986 to 408 in 2000 (http://www.tpwd.state.tx.us/huntwild/hunt/wma/wildlife_management/kerr_wma/management_programs/endangered_species/). Kickapoo Cavern State park is home to one of the largest breeding populations of the BCVI on state-owned lands (http://www.tpwd.state.tx.us/spdest/findadest/parks/kickapoo_cavern/).

Currently, the USFWS range map for the BCVI shows the species as being present in 64 counties in Texas. The range depicted on the map for the BCVI stretches from southwest Texas, across central and west Texas, up to north-central Texas in Montague County on the border of Oklahoma and Texas. To date, 75 percent of the known BCVI population is found on four areas: Fort Hood Military Reserve, Kerr Wildlife Management Area, Wichita Mountains Wildlife Refuge, and Fort Sill (Wilkins et al. 2006). Wilkins et al. (2006) estimated that approximately 1.45 million acres of potential habitat for the BCVI occurs within 53 Texas counties, which is roughly three percent of the total area within the range of the species.

BCVI Habitat

Breeding habitat throughout the BCVI's range varies considerably in its vegetation characteristics. Generally, the habitat is described as shrubland thickets of various size and distribution where vegetation cover extends to ground level. A wide diversity of plant species can provide the habitat structure that BCVIs require. The most common type of nesting substrate appears to be species of sumac (*Rhus* spp.) (USFWS 1991) typically associated with shin oak, Ashe juniper, Texas oak, plateau live oak, and other woody vegetation that forms open shrublands or savannah with highly developed edges. Analysis revealed that a factor common to vireo territories and distinguishing them from non-vireo areas was a high density of deciduous vegetation from 0 to 3 meters and a total woody cover ranging from 35 to 55 percent (USFWS 1991).

While low deciduous cover is the key element in BCVI habitat, the USFWS recovery plan has identified three other characteristics that are of secondary importance and are related to maintaining the primary key element. One secondary characteristic is a greater heterogeneity in vegetation structure within BCVI territory (USFWS 1991). Another secondary characteristic is the Ashe juniper cover present in the habitat. While GCWAs require mature juniper trees for their breeding habitat, BCVIs tend to choose sites where Ashe juniper is underrepresented, averaging fewer than six percent of the overall woody cover (USFWS 1991). BCVIs may actually be indifferent to the presence of juniper trees; however, a higher amount of Ashe juniper in the area reduces the key element—deciduous vegetation that is low to the ground (USFWS 1991). The third secondary characteristic is the presence and composition of open space. A prime habitat has 35 to 55 percent woody cover, leaving 45 to 65 percent open (USFWS 1991). This open space tends to occur as spacing between individual bushes instead of large open gaps bordering very dense areas of woody vegetation.

An element of the BCVI habitat important to note is that the prime habitat is a transitional vegetation stage, not a climax community. The shrubland habitat is successional and can pass through stages of suitability and unsuitability for the BCVI. While management of GCWA habitat includes the preservation and protection of climax Ashe juniper-oak woodland communities, management of the BCVI habitat requires actions or incidents that keep the vegetation in an early-successional stage. This low, deciduous shrubland is typically found on shallow soils over rocky substrate, along gullies and ravine edges, and on eroded slopes. This soil type and geology can aid in keeping the vegetation low and shrubby, but other factors can create prime BCVI habitat. Fire, grazing, plowing, or any other form of periodic site disturbance can also influence the quality of the habitat for vireo nesting (USFWS 1991). Based on research conducted in central and southeast portions of the Edwards Plateau, the areas most heavily utilized by breeding BCVIs tend to be in vegetation communities that occur over limestone formations (e.g., the Fredericksburg formation) and are recovering from burning or clearing.

The suitability of breeding habitat can be relatively short-lived, depending on climatic and other factors. In the eastern-thirds of the BCVI range in Texas, suitable habitat changes into closed-canopy hardwood forests. The sucessional nature of the habitat is more pronounced in the northern and eastern portions of the breeding range (Wilkins et al. 2006).

BCVI Breeding/Reproduction

Territory size for the BCVI can range between 1 to 10 acres, but is usually 2 to 4 acres (USFWS 1991). According to the USFWS recovery plan, vireos territories are often clustered in patches of suitable habitat. Larger groupings of 15 or more territories contain more adult males than smaller groupings (fewer than 10 territories), and reproductive success is greater in the larger groupings than the smaller (USFWS 1991). Annual returns of males in the larger groupings have been documented between 60 and 70 percent, while return of adult females and males in smaller groupings is only about 39 to 61 percent. Site fidelity is greater for males in the larger groupings, and the differences in return percentages between the two groups may show that young males are dispersing off-site after the first year (USFWS 1991).

Adult males are the first to arrive on the breeding grounds and stake out territory. Females, upon their arrival, assess both male quality and the quality of the territory and then form breeding pairs (Guilfoyle 2002). First-year males often remain unmated during their first breeding season but may occasionally breed later during the season with females who are attempting a second nesting (Guilfoyle 2002). Nesting begins as soon as the females arrive and can continue through August with some females producing a second clutch while the male cares for the first brood. BCVIs construct small, cup-shaped nests in the most-dense zones of deciduous vegetation, usually suspended from forks in horizontal branches at a height ranging between 40 and 120 centimeters (USFWS 1991). In 1985, a study was done that summarized known nest sites of the BCVI and found that 63 percent of the documented nest sites were found in four species of woody vegetation: *Quercus marilandica, Q. shumardii texan*a, *Q. stellata*, and *Rhus virens* (Federal Register).

Reproductive success for the BCVI is difficult to determine. Success rates largely depend on human intervention in areas with brown-headed cowbird parasitism. In 1991, the success rate for the BCVI on sites

throughout Texas was estimated to be an average of one young per breeding pair (UWFWS 1991). At Fort Hood Military Reservation, the reproductive success rate of the BCVI in 1987, before the cowbird eradication program began, was only five percent. In 1996, after seven years of controlling cowbird populations in the area, the reproductive success of the vireo at Fort Hood jumped to 45.5 percent (Audubon article).

Reasons for Listing BCVI and Current Threats

The BCVI populations have decreased precipitously since the species was first documented (USFWS 1991). At the time of listing the major threats included low reproductive success, low recruitment (survivability), nest parasitism, direct habitat destruction, habitat fragmentation, overgrazing by domestic livestock and white-tailed deer, oak wilt, pesticides, and habitat deterioration through cessation of fire (USFWS 1991).

It is currently accepted that habitat conversion through land uses may be one of the greatest threats to the species (Wilkins et al. 2006). The breeding habitat for the BCVI is usually an area that is in the early-transitional stages following some form of disturbance. Vegetational succession will usually convert vireo habitat either from prairie grasslands to closed-canopy hardwood forest or cedar brakes so dense that the necessary understory is suppressed (http://www.fws.gov/southwest/es/arlingtontexas/pdf/BCVI). Historically, wildfires would have cleared BCVI habitats every three to five years, removing Ashe juniper and other dense, overgrown areas and promoting the growth of more fire-resistant woody species. This natural fire occurrence aided in maintaining the shrubland vegetation used by the BCVI. Fire suppression may have caused some BCVI habitat to become overgrown and unsuitable for use. In addition, the increase in woody cover across a variety of non-woodland habitats in Texas and beyond may have had an adverse affect on the BCVI (Wilkins et al. 2006). In the eastern portion of the BCVI range, active management is required to maintain BCVI habitat because natural plan succession will convert suitable habitat to woodlands (http://www.tpwd.state.tx.us/ publications/pwdpubs/media/pwd_bk_w7000_0013_ black_capped_vireo.pdf).

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Attachment 4

Habitat Block Descriptions

US 281 from Borgfeld Road to Loop 1604

Habitat Block 1

Block 1 is a linear patch of riparian woodlands/savanna and associated slopes on the east side of US 281, extending from Ramblewood Rd. to Trinity Park Blvd. The patch, which encompasses approximately 36.6 acres in the study area, follows an intermittent unnamed tributary of Cibolo Creek that flows northward parallel and adjacent to US 281. The dominant woody species of this woodland patch include plateau live oak (*Quercus fusiformis*) and Ashe juniper (*Juniperus ashei*), with lesser amounts of Texas oak (*Q. buckleyi*), Texas sugarberry (*Celtis laevigata*), and Texas walnut (*Juglans microcarpa* var. *microcarpa*). The understory of this woodland patch and the edges of openings are generally well-developed with juniper limbs, vines, and various shrubs, including Texas persimmon (*Diospyros texana*) and grape (*Vitis* spp.). The junipers in this patch are mature in the riparian zone and moderate-aged on upland slopes. The average aerial coverage of this block is approximately 75 percent and the average height was estimated to be 40 feet. The patch is connected to more expansive woodlands that occur in the steep hills east of US 281 overlooking Cibolo Creek. Access to the habitat block is from the US 281 ROW and six private properties adjacent to the ROW.

Habitat Block 2

Block 2 consists of a relatively large patch of undeveloped woodlands and savanna located on the west side of US 281 that extends from the northern project terminus south to a developed area north of Bulverde Rd. In the study area, this habitat block encompasses approximately 48.2 acres and consists primarily of east-facing upland slopes with small side drainages and canyons perpendicular to US 281. The dominant woody species of this woodland patch include plateau live oak and Ashe juniper. Other woody species include Texas oak, cedar elm (*Ulmus crassifolia*), escarpment black cherry (*Prunus serotina* var. *eximius*), and Texas walnut. Like Block 1, the understory of this patch is generally well-developed with juniper limbs, vines, and various shrubs. In most portions of this patch the junipers are mature, but the juniper cover consists of regrowth in small clearings. The average aerial coverage of this block is approximately 65 percent and the

average height was estimated to be 30 feet. The patch is connected to additional oak-juniper woodlands that occur in the steep hills west of US 281 and south of Cibolo Creek. Access to the habitat block is from the US 281 ROW and three private properties adjacent to the ROW.

Habitat Block 3

Block 3 is a small patch of woodlands adjacent to Bulverde Rd. on the east side of US 281. The patch, which encompasses approximately 4.4 acres in the study area, is situated on a gentle southwest facing slope at the head of Elm Waterhole Creek. The dominant woody species of this woodland patch is plateau live oak. Other species in the woodland include Texas sugarberry, Ashe juniper, Texas oak, mountain laurel (*Sophora secundiflora*), and cedar elm. The understory of this woodland patch and the edges of openings appear to be well-developed with juniper limbs, vines, and various shrubs. The junipers in this patch appear to be relatively mature. The average aerial coverage of this block is approximately 65 percent and the average height was estimated to be 25 feet. The patch is connected to additional woodlands that occur in the hilly terrain associated with Elm Waterhole Creek south and east of US 281. Access to the habitat block is from the US 281 and Bulverde Rd. ROWs and one private property between the habitat patch and the US 281 ROW.

Habitat Block 4

Block 4 is a small linear strip of woodlands west of US 281 and adjacent to Bulverde Rd. The patch, which includes approximately 2.5 acres in the study area, is situated on a gentle northeast facing slope and is separated from the existing US 281 ROW by an oak woodland with the understory completely removed. The dominant woody species of this woodland patch is plateau live oak and Ashe juniper. The understory of this patch appears to be well-developed and the junipers are relatively mature. The average aerial coverage of this block is approximately 55 percent and the average height was estimated to be 30 feet. The woodland patch is isolated from additional woodlands that occur north of Estate Gate by at least three residences in the small habitat patch. Access to the habitat block is from the Bulverde Rd. ROW and one private property between the habitat patch and the US 281 ROW. After accessing one private parcel and re-evaluating the quality of the block, based on the

residential disturbance within the block and isolation of this patch, it is recommended the block be dismissed from further consideration as potential habitat for the GCWA.

Habitat Block 5

Block 5 is a small patch of woodlands on the east side of US 281 south of WR Larsen Rd. The patch, which encompasses approximately 3.9 acres in the study area, is situated on a gentle west-facing upland slope. The dominant woody species include plateau live oak and Ashe juniper. Other woody species include Texas sugarberry and cedar elm in the canopy and prickly pear (*Opuntia* spp.), Texas persimmon, and flameleaf sumac (*Rhus copallinum*). The understory of this patch is generally well-developed and Ashe junipers are relatively mature. The average aerial coverage of this block is approximately 70 percent and the average height was estimated to be 30 feet. Although developed areas occur on either side of the patch along the US 281 ROW, the patch is connected to a larger patch of oak-juniper woodlands that extends eastward to Bulverde Rd. Access to the habitat block is from the US 281 ROW.

Habitat Block 6

Block 6 is a patch of woodlands on a gentle west-facing slope on the west side of US 281 adjacent to Celebration (private road). In the study area, this habitat block encompasses approximately 9.4 acres. The woodlands are separated from US 281 by a veneer of cleared/commercial land cover that extends up to 100 feet from the ROW. The dominant woody species of this woodland patch include plateau live oak and Ashe juniper, with lesser amounts of Texas oak, Texas sugarberry skunkbush sumac (*Rhus aromatica*), flameleaf sumac, and prickly pear. The understory of this woodland patch and the edges of openings are generally well-developed with juniper limbs, vines, and various shrubs. The junipers in this patch are variable and consist of regrowth in some areas and mature individuals in other areas. The average aerial coverage of this block is approximately 65 percent and the average height was estimated to be 30 feet. The patch is connected to more expansive woodlands that occur in the steep hills west of US 281 and extend to Bulverde Rd. However, this larger patch has been partially

developed with low density residences. Access to the habitat block is from the Celebration Rd. ROW and two private properties adjacent to the ROW.

Habitat Block 7

Block 7 is a relatively large patch of woodlands/ savanna on the east side of US 281 between Marshall and just north of Summerglen. The patch, which encompasses approximately 48.4 acres in the study area, is primarily situated on a gentle south and west-facing upland slopes, but has some headwater ravines. The dominant woody species include plateau live oak and Ashe juniper. Other woody species include Texas sugarberry and cedar elm in the canopy and prickly pear, agarita, and Texas persimmon in the understory and on woodland edges. The understory of this patch is generally well-developed and Ashe junipers vary from regrowth to relatively mature. The average aerial coverage of this block is approximately 60 percent and the average height was estimated to be 30 feet. The patch is relatively undeveloped adjacent to the US 281 ROW and is connected to the woodlands that occur in the steep hills west of US 281 to Bulverde Rd. that have been partially developed with low density residences. This larger patch is also connected to habitat block 6. Access to the habitat block is from the US 281 ROW and four private properties.

Habitat Block 8

Block 8 is a relatively small patch of woodlands on the east side of US 281 between Overlook and Summerglen. The patch, which encompasses approximately 8.1 acres in the study area, is situated on a gentle east-facing slope across from block 7. The dominant woody species of this patch are Ashe juniper and plateau live oak. The understory and the edges of openings appear to be well-developed with juniper limbs and various shrubs. The junipers appear to be relatively young adjacent to the US 281 ROW, but are more mature further west within the study area. The average aerial coverage of this block is approximately 70 percent and the average height was estimated to be 20 feet. The patch is connected to a relatively small area of oak-juniper woodlands adjacent to Summerglen, but the woods are surrounded by residential developments. Access to the habitat block is from the US 281, Summerglen, and Overlook ROWs.

Habitat Block 9

Block 9 is a relatively large patch of woodlands and savanna on the west side of US 281 between Oakland and Stone Oak Parkway. The patch, which encompasses approximately 40.4 acres in the study area, is situated primarily on gentle west-facing slopes interspersed with ephemeral drainages in minor ravines. The dominant woody species include Ashe juniper and plateau live oak with lesser amounts of Texas oak, Texas ash (*Fraxinus texensis*), and Texas sugarberry. The understory and the edges of openings appear to be well-developed with juniper limbs, greenbriar (*Smilax bona-nox*) and other vines, and various shrubs including Texas persimmon, prickly pear, and agarita (*Berberis trifoliata*). The junipers are of various size classes but are primarily moderate-aged. The average aerial coverage of this block is approximately 70 percent and the average height was estimated to be 35 feet. The patch is connected to a larger area of oak-juniper woodlands to the west. Access to the habitat block is from the US 281 and Stone Oak Parkway ROWs and three relatively large private parcels.

Habitat Block 10

Block 10 is a relatively small patch of savanna/woodlands on the east side of US 281 between Encino Rio Rd. and Evans Rd. The patch encompasses approximately 8.0 acres in the study area and is situated on a gentle southwest-facing slope adjacent to an unnamed tributary of Elm Creek. The dominant woody species of this patch include plateau live oak and Ashe juniper. Other woody species include Texas sugarberry, huisache (*Acacia fernesiana*), and Texas persimmon. The understory of this patch and the edges of openings are well-developed, but the entire patch, including the juniper component, is relatively young. The average aerial coverage of this block is approximately 50 percent and the average height was estimated to be 25 feet. Access to the habitat block is from the US 281 ROW and an unnamed side road that connects Encino Rio to a commercial development north of the block. The patch is isolated from additional woodlands by residential and commercial developments. After re-evaluating the quality of the habitat and its lack of connectivity to

larger tracts of woodlands, Block 10 is recommended to be dropped from further consideration as potential GCWA habitat.

Habitat Block 11

Block 11 is a relatively small patch of woodlands on the east side of US 281 south of Encino Rio and adjacent to the access road to the San Antonio Water Supply tanks. The patch, which encompasses approximately 4.4 acres in the study area, is situated on a gentle west-facing upland slope. At the time of the habitat assessment, the dominant woody species included plateau live oak and Ashe juniper, but toward the end of the survey, **all** the Ashe juniper was removed and converted to mulch. Other woody species remaining include Texas sugarberry, elbow bush (*Foretiera pubescens*) and prickly pear. The understory of this patch was generally well-developed and Ashe junipers varied from regrowth to relatively mature. The average aerial coverage of this block was approximately 80 percent and the average height was estimated to be 35 feet. Access to the habitat block is from the US 281 ROW, the private road to the water tanks, and one private property. The habitat block was already somewhat isolated by residential and commercial developments, and the small amount of woodlands outside the study area adjacent to the block have recently been cleared of Ashe juniper. This patch is no longer suitable habitat for the golden-cheeked warbler and should be dismissed from further consideration.

Habitat Block 12

Block 12 is a relatively small patch of woodlands and savanna on the east side of US 281 between Ridgetop Parkway and Redland. The patch is situated primarily on north and south-facing slopes overlooking Mud Creek and a riparian woodland along Mud Creek. The patch encompasses approximately 8.8 acres in the study area. The dominant woody species in the riparian zone include plateau live oak, Ashe juniper, honey mesquite (*Prosopis glandulosa*), cedar elm and Texas sugarberry. The upland slopes included plateau live oak, honey mesquite, huisache, cedar elm, Texas persimmon, agarita, and prickly pear during the habitat assessment, but

widespread cedar cutting has occurred since the survey commenced in early April, 2009. A few small Ashe junipers were not cut in the riparian zone and slope south of Mud Creek. The average aerial coverage of the riparian woods is approximately 85 percent and the average height was estimated to be 40 feet. The woodland/savanna on the slopes was estimated to cover approximately 60 percent prior to the clearing and post clearing estimates are approximately 40 percent. The estimated height of the woods/savanna is approximately 30 feet. The patch is only connected to the riparian corridor along Mud Creek, which continues to the south and east. Access to the habitat block is from the US 281 and Ridgetop Parkway ROWs and four private parcels.

Habitat Block 13

Block 13 consists of a patch of riparian woodlands on the west side of US 281 along Mud Creek and a woodland patch on a north-facing slope that is separated from the riparian zone by a clearing. This patch encompasses approximately 7.6 acres in the study area. Both woodlands are occupied by plateau live oak, Ashe juniper, cedar elm, Texas sugarberry, and huisache. The understory of these woodland patches and the edges of openings are generally well-developed with juniper limbs, vines, and various shrubs. The junipers in this patch are variable and consist of regrowth in some areas and mature individuals in other areas. The average aerial coverage of this block is approximately 85 percent and the average height was estimated to be 40 feet. The patch is connected to more expansive woodlands/savanna to the west and along the Mud Creek riparian zone to the east. Access to the habitat block is from the US 281 ROW.

Attachment 5

Avian Species Observed During the Spring 2009 GCWA Presence-Absence Survey

Avian Species Observed During the Spring 2009 GCWA Presence-Absence Survey

Anatidae

Black-bellied Whistling Duck (*Dendrocygna autumnalis*)

Odontophoridae

Northern Bobwhite (*Colinus virginianus*)

Ardeidae

Cattle Egret (*Bubulcus ibis*)

Cathartidae

Black Vulture (*Coragyps atratus*)

Turkey Vulture (*Cathartes aura*)

Accipitridae

Mississippi Kite (*Ictinia mississippiensis*)

Cooper's Hawk (*Accipiter cooperii*)

Red-tailed Hawk (*Buteo jamaicensis*)

Falconidae

Crested Caracara (*Caracara cheriway*)

Charadriidae

Killdeer *Charadrius vociferous*)

Upland Sandpiper (*Bartramia longicauda*)

Columbidae

Rock Pigeon (*Columba livia*)

Eurasian Collared-Dove (*Streptopelia decaocto*)

White-winged Dove (*Zenaida asiatica*)

Mourning Dove (*Zenaida macroura*)

Inca Dove (*Columbina inca*)

Cuculidae

Yellow-billed Cuckoo (*Coccyzus americanus*)

Greater Roadrunner (*Geococcyx californianus*)

Caprimulgidae

Common Nighthawk (*Chordeiles minor*)

Apodidae

Chimney Swift (*Chaetura pelagic*)

Trochilidae

Ruby-throated Hummingbird (*Archilochus colubris*)

Black-chinned Hummingbird (*Archilochus alexandri*)

Picidae

Golden-fronted Woodpecker (*Melanerpes aurifrons*)

Ladder-backed Woodpecker (*Picoides scalaris*)

Tyrannidae

Eastern Wood-Pewee (*Contopus virens*)

Eastern Phoebe (*Sayornis phoebe*)

Ash-throated Flycatcher (*Myiarchus cinerascens*)

Great Crested Flycatcher (*Myiarchus crinitus*)

Western Kingbird (*Tyrannus verticalis*)

Eastern Kingbird (*Tyrannus tyrannus*)

Scissor-tailed Flycatcher (*Tyrannus forficatus*)

Laniidae

Loggerhead Shrike (*Lanius ludovicianus*)

Vireonidae

White-eyed Vireo (*Vireo griseus*)

Yellow-throated Vireo (*Vireo flavifrons*)

Blue-headed Vireo (*Vireo solitaries*)

Red-eyed Vireo (*Vireo olivaceus*)

Corvidae

Blue Jay (*Cyanocitta cristata*)

Western Scrub-Jay (*Aphelocoma californica*)

Hirundinidae

Purple Martin (*Progne subis*)

Cliff Swallow (*Petrochelidon pyrrhonota*)

Cave Swallow (*Petrochelidon fulva*)

Barn Swallow (*Hirundo rustica*)

Paridae

Black-crested Titmouse (*Baelophus atricristatus*)

Carolina Chickadee (*Poecile carolinensis*)

Troglodytidae

Canyon Wren (*Catherpes mexicanus*)

Carolina Wren (*Thryothorus ludovicianus*)

Bewick's Wren (*Thryomanes bewickii*)

House Wren (*Troglodytes aedon*)

Regulidae

Ruby-crowned Kinglet (*Regulus calendula*)

Sylviidae

Blue-gray Gnatcatcher (*Polioptila caerulea*)

Turdidae

Hermit Thrush (*Catharus guttatus*)

Swainson's Thrush (*Catharus ustulatus*)

Mimidae

Northern Mockingbird (*Mimus polyglottos*)

Sturnidae

European Starling (*Sturnus vulgaris*)

Parulidae

Tennessee Warbler (*Vermivora peregrine*)

Orange-crowned Warbler (*Vermivora celata*)

Nashville Warbler (*Vermivora ruficapilla*)

Yellow Warbler (*Dendroica petechia*)

Chestnut-sided Warbler (*Dendroica pensylvanica*)

Black-throated Green Warbler (*Dendroica virens*)

Blackburnian Warbler (*Dendroica fusca*)

Black-and-white Warbler (*Mniotilta varia*)

Worm-eating Warbler (*Helmitheros vermivorum*)

Common Yellowthroat (*Geothlypis trichas*)

Yellow-breasted Chat (*Icteria virens*)

Thraupidae

Summer Tanager (*Piranga rubra*)

Emberizidae

Rufous-crowned Sparrow (*Aimophila ruficeps*)

Chipping Sparrow (*Spizella passerine*)

Clay-colored Sparrow (*Spizella pallid*)

Lark Sparrow (*Chondestes grammacus*)

Cardinalidae

Northern Cardinal (*Cardinalis cardinalis*)

Rose-breasted Grosbeak (*Pheucticus ludovicianus*)

Blue Grosbeak (*Passerina caerulea*)

Indigo Bunting (*Passerina cyanea*)

Painted Bunting (*Passerina ciris*)

Icteridae

Great-tailed Grackle (*Quiscalus mexicanus*)

Brown-headed Cowbird (*Molothrus ater*)

Bullock's Oriole (*Icterus bullockii*)

Baltimore Oriole (*Icterus galbula*)

Fringillidae

House Finch (*Carpodacus mexicanus*)

Lesser Goldfinch (*Carduelis psaltria*)

Passeridae

House Sparrow (*Passer domesticus*)

Attachment 6

GCWA Presence-Absence Field Data Forms

GOLDEN-CHEEKED WARBLER PRESENCE/ABSENCE FIELD DATA FORM

Study Site (circle)	US 281 or Loop 1604	Weather Conditions		
Habitat Block #	1-8		Begin	End
Observer	Mark Kainer	Temp	45	65
Date	4/3/09	Cloud Cover	Partly Cloudy	clear
Field Visit #	2	Precipitation	—	—
Time Begin—End	6:50 - 1:00	Wind Speed/Direction	Min 0	Max 5 SE

General Notes (e.g., additional wildlife information, observed human activity on site, etc.)

Avian spp detected: black-crested titmouse, N. cardinal, ruby-crowned Kinglet, N. mockingbird, turkey vulture, Carolina wren, great-tailed grackle, ash-throated flycatcher, mourning dove, house sparrow, European starling, Carolina chickadee, rufous-crowned sparrow, black-chinned hummingbird, red-tailed hawk, house finch, Bewick's wren, inca dove, cattle egret, northern bobwhite.

Golden-cheeked Warbler Observations

Male #	Song Type	Female #	Juv #	Distance from Observer (feet)	Direction from Observer (degrees)	Time of Observation	Observation Type (Auditory or Visual)	Observation Mapped or GPS-recorded (Yes or No)

Additional Notes

GOLDEN-CHEEKED WARBLER PRESENCE/ABSENCE FIELD DATA FORM

Study Site (circle)	(US 281) or Loop 1604	Weather Conditions		
Habitat Block #	1-8		Begin	End
Observer	Nick Wallisch	Temp	62°	74°
Date	4-10-09	Cloud Cover	100%	50%
Field Visit #	2	Precipitation	—	—
Time Begin—End	6:45-1:00	Wind Speed/Direction	Min 5 NE	Max 12 NE

General Notes (e.g., additional wildlife information, observed human activity on site, etc.)

Species observed: N. Cardinal, B.C. Titmouse, Car. Chickadee, W.E. Vireo, B.H. Cowbird, Barn Swallow, L. Goldfinch, Bew. Wren, R.T. Hummingbird T. Vulture, E. Phoebe, Summer Tanager, N. Mockingbird, R.C. Kinglet, Car. Wren, W.W. Dove, G.T. Grackle, E. Starling, B.G. Gnatcatcher, Barn Swallow, L.B. Woodpecker, B. Vulture

Golden-cheeked Warbler Observations

Male #	Song Type	Female #	Juv #	Distance from Observer (feet)	Direction from Observer (degrees)	Time of Observation	Observation Type (Auditory or Visual)	Observation Mapped or GPS-recorded (Yes or No)

Additional Notes

GOLDEN-CHEEKED WARBLER PRESENCE/ABSENCE FIELD DATA FORM

Study Site (circle)	US 281 or Loop 1604	Weather Conditions		
Habitat Block #	1-8		Begin	End
Observer	Nick Wallisch	Temp	59°	94°
Date	4-22-09	Cloud Cover	50%	50%
Field Visit #	3	Precipitation	—	—
Time Begin—End	6:30 - 1:00	Wind Speed/Direction	Min 3mph SE	Max 10mph

General Notes (e.g., additional wildlife information, observed human activity on site, etc.)

Species observed: Northern Cardinal, N. Mockingbird, Car. Chickadee, B.C. Titmouse, Car. Wren, B. Wren, Canyon Wren, L.B. Woodpecker, Lesser Goldfinch, House Finch, Cliff Swallow, Barn Swallow, Cave Swallow, W. Scrub Jay, Blue Jay, Nashville Warbler, Orange-crowned Warbler, W.E. Vireo, Painted Bunting, Bullock's Oriole, E. Phoebe, S.T. Flycatcher, G.T. Grackle, B.H. Cowbird, M Dove, W.W. Dove, Turkey Vulture, Black Vulture, Black-chinned Hummingbird, House Sparrow

Golden-cheeked Warbler Observations

Male #	Song Type	Female #	Juv #	Distance from Observer (feet)	Direction from Observer (degrees)	Time of Observation	Observation Type (Auditory or Visual)	Observation Mapped or GPS-recorded (Yes or No)

Additional Notes

GOLDEN-CHEEKED WARBLER PRESENCE/ABSENCE FIELD DATA FORM

Study Site (circle)	US 281 or Loop 1604	Weather Conditions		
Habitat Block #	1-8		Begin	End
Observer	Nick Wallisch	Temp	71°	83°
Date	4-30-09	Cloud Cover	100%	75%
Field Visit #	4	Precipitation	—	—
Time Begin—End	6:30 - 1:00	Wind Speed/Direction	Min 0mph	Max 7mph SE

General Notes (e.g., additional wildlife information, observed human activity on site, etc.)

Species Observed: N. Cardinal, B.C. Titmouse, Car. Chickadee, N. Mockingbird, L. Goldfinch, Nashville Warbler, Black-and-white Warbler, Common Yellowthroat, Yellow Warbler, Yellow-breasted Chat, E. Phoebe, W. Kingbird, W. Scrub Jay, House Finch, M. Dove, W.W. Dove, Painted Bunting, Barn Swallow, Cliff Swallow, Chimney Swift, T. Vulture, B. Vulture, Swainson's Thrush, Summer Tanager, B.H. Vireo, W.E. Vireo, R.T. Hummingbird, Car. Wren, Bew. Wren, H. Wren, H. Sparrow, G.T. Grackle, B.H. Cowbird,

Golden-cheeked Warbler Observations

Male #	Song Type	Female #	Juv #	Distance from Observer (feet)	Direction from Observer (degrees)	Time of Observation	Observation Type (Auditory or Visual)	Observation Mapped or GPS-recorded (Yes or No)

Additional Notes

GOLDEN-CHEEKED WARBLER PRESENCE/ABSENCE FIELD DATA FORM

Study Site (circle)	US 281 or Loop 1604	Weather Conditions		
Habitat Block #	1-8		Begin	End
Observer	Nick Wallisch	Temp	75°	89°
Date	5-8-09	Cloud Cover	100%	75%
Field Visit #	5	Precipitation	—	—
Time Begin—End	6:30 - 12:00	Wind Speed/Direction	Min 2 mph Var.	Max 12 SE

General Notes (e.g., additional wildlife information, observed human activity on site, etc.)

Species Observed: N. Cardinal, B.C. Titmouse, Car. Chickadee, Car. Wren, Bew. Wren, E. Phoebe, L. Goldfinch, B.C. Hummingbird, Painted Bunting, Rufous-crowned Sparrow, T. Vulture, R.T. Hawk, M. Dove, W.W. Dove, C.C. Sparrow, Barn Swallow, Cliff Swallow, N. Mockingbird, B.H. Cowbird, G.T. Grackle, E. Wood-Pewee, S.T. Flycatcher, H. Sparrow, W.E. Vireo,

Golden-cheeked Warbler Observations

Male #	Song Type	Female #	Juv #	Distance from Observer (feet)	Direction from Observer (degrees)	Time of Observation	Observation Type (Auditory or Visual)	Observation Mapped or GPS-recorded (Yes or No)

Additional Notes

GOLDEN-CHEEKED WARBLER PRESENCE/ABSENCE FIELD DATA FORM

Study Site (circle)	US 281 or Loop 1604	Weather Conditions		
Habitat Block #	1-8		Begin	End
Observer	Mark Kainer	Temp	72	85
Date	5/15/09	Cloud Cover	PC	PC
Field Visit #	6	Precipitation	—	—
Time Begin—End	6:30 - 1:00	Wind Speed/Direction	Min 0	Max 10 SE

General Notes (e.g., additional wildlife information, observed human activity on site, etc.)

Avian Spp. heard or observed

Northern cardinal, titmice, black-bellied whistling duck, mourning dove, great-tailed grackle, Bewicks wren, white-winged dove, barn swallow, Carolina wren, summer tanager (nest), roadrunner, rufous crown sparrow, Carolina chickadee, eastern Kingbird, great-crested flycatcher, eastern phoebe, GF woodpecker, scrub jay, rock dove, turkey vulture, European starling, white-eyed vireo,

Golden-cheeked Warbler Observations

Male #	Song Type	Female #	Juv #	Distance from Observer (feet)	Direction from Observer (degrees)	Time of Observation	Observation Type (Auditory or Visual)	Observation Mapped or GPS-recorded (Yes or No)

Additional Notes

Played taped calls of GCWA and eastern screech owl. No GCWA's heard or observed

GOLDEN-CHEEKED WARBLER PRESENCE/ABSENCE FIELD DATA FORM

Study Site (circle)	US 281 or Loop 1604	Weather Conditions		
Habitat Block #	9-13		Begin	End
Observer	Mark Kainer	Temp	55	62
Date	4/1/09	Cloud Cover	clear	clear
Field Visit #	1	Precipitation	—	—
Time Begin—End	6:45 – 10:15	Wind Speed/Direction	Min 0	Max 5 SE

General Notes (e.g., additional wildlife information, observed human activity on site, etc.)

Avian Spp: mourning dove, black-crested titmouse, Northern cardinal, blue grey gnatcatcher, Coopers hawk, ruby-crowned Kinglet, orange-crowned warbler, Northern mockingbird, great-tailed grackle, house sparrow, white-winged dove, Bewicks wren, house finch, cliff swallow, killdeer, Nashville warbler, chipping sparrow, turkey vulture, crested caracara, upland sandpiper.

Golden-cheeked Warbler Observations

Male #	Song Type	Female #	Juv #	Distance from Observer (feet)	Direction from Observer (degrees)	Time of Observation	Observation Type (Auditory or Visual)	Observation Mapped or GPS-recorded (Yes or No)

Additional Notes

GOLDEN-CHEEKED WARBLER PRESENCE/ABSENCE FIELD DATA FORM

Study Site (circle)	US 281 or Loop 1604	Weather Conditions		
Habitat Block #	9-13		Begin	End
Observer	Mark Kainer	Temp	55	69
Date	4/8/09	Cloud Cover	clear	clear
Field Visit #	2	Precipitation	—	—
Time Begin—End	6:40 - 9:45	Wind Speed/Direction	Min 0	Max 5 5

General Notes (e.g., additional wildlife information, observed human activity on site, etc.)

Avian species observed: western scrub jay, Northern cardinal, greater roadrunner, Bewick's wren, golden-fronted woodpecker, chipping sparrow, orange-crowned warbler, blue jay, mourning dove, turkey vulture, black-crested titmouse, Carolina chickadee, house sparrow, cliff swallow, Northern mockingbird, Carolina wren, turkey vulture, Eurasian collared dove, common nighthawk, loggerhead shrike, purple martin, lark sparrow

Golden-cheeked Warbler Observations

Male #	Song Type	Female #	Juv #	Distance from Observer (feet)	Direction from Observer (degrees)	Time of Observation	Observation Type (Auditory or Visual)	Observation Mapped or GPS-recorded (Yes or No)

Additional Notes

GOLDEN-CHEEKED WARBLER PRESENCE/ABSENCE FIELD DATA FORM

Study Site (circle)	US 281 or Loop 1604	Weather Conditions		
Habitat Block #	9-13.		Begin	End
Observer	Nick Wallisch	Temp	55	71
Date	4/21/09	Cloud Cover	Clear	clear
Field Visit #	3	Precipitation	—	—
Time Begin—End	6:30-9:45	Wind Speed/Direction	Min 0	Max 5 SW

General Notes (e.g., additional wildlife information, observed human activity on site, etc.)

Avian species observed: Northern Cardinal, black-crested titmouse, Northern mockingbird, white-eyed vireo, Nashville warbler, Tennessee warbler, Carolina wren, Bewicks wren, western scrub jay, cliff swallow, mourning dove, crested caracara, turkey vulture, black vulture, white-winged dove, blue gray gnat-catcher, ruby throated hummingbird, yellow-throated vireo, Carolina chickadee, house finch, painted bunting, red-tailed hawk, house sparrow, eastern phoebe, barn swallow

Golden-cheeked Warbler Observations

Male #	Song Type	Female #	Juv #	Distance from Observer (feet)	Direction from Observer (degrees)	Time of Observation	Observation Type (Auditory or Visual)	Observation Mapped or GPS-recorded (Yes or No)

Additional Notes

GOLDEN-CHEEKED WARBLER PRESENCE/ABSENCE FIELD DATA FORM

Study Site (circle)	US 281 or Loop 1604	Weather Conditions		
Habitat Block #	9-13		Begin	End
Observer	Nick Wallisch	Temp	71°	74°
Date	4/29/09	Cloud Cover	Overcast	Overcast
Field Visit #	4	Precipitation	mist	——
Time Begin—End	6:30 - 9:30	Wind Speed/Direction	Min 0	Max 3 SE

General Notes (e.g., additional wildlife information, observed human activity on site, etc.)

Avian Spp. Observed: western scrub jay, chimney swift, black-chinned hummingbird, Northern cardinal, black-crested titmouse, great-tailed grackle, black-throated green warbler, yellow warbler, blackburnian warbler, worm-eating warbler, chestnut-sided warbler, hermit thrush, painted bunting, rose-breasted grosbeak, Baltimore oriole, brown-headed cowbird, clay-colored sparrow, house sparrow, mourning dove, western scrub jay, Carolina chickadee, Carolina wren,

Golden-cheeked Warbler Observations

Male #	Song Type	Female #	Juv #	Distance from Observer (feet)	Direction from Observer (degrees)	Time of Observation	Observation Type (Auditory or Visual)	Observation Mapped or GPS-recorded (Yes or No)

Additional Notes

Avian Spp. Continued: Bewicks wren, barn swallow, cliff swallow, white-winged dove, Western Kingbird, house wren, blue-headed vireo, white-eyed vireo, red-tailed hawk, northern mockingbird, golden-fronted woodpecker, ladderback woodpecker, turkey vulture, lesser goldfinch, house finch, Crested Cara Cara, Mississippi Kite, black vulture indigo bunting.

GOLDEN-CHEEKED WARBLER PRESENCE/ABSENCE FIELD DATA FORM

Study Site (circle)	US 281 or Loop 1604	Weather Conditions		
Habitat Block #	9-13		Begin	End
Observer	Nick Wallisch	Temp	75°	84°
Date	5/7/09	Cloud Cover	Overcast	Overcast
Field Visit #	5	Precipitation	—	—
Time Begin—End	6:30 - 9:40	Wind Speed/Direction	Min 0	Max 5 SE

General Notes (e.g., additional wildlife information, observed human activity on site, etc.)

Avian Spp. Observed: Northern cardinal, black-crested titmouse, Carolina chickadee, Northern mockingbird, Carolina wren, Bewicks wren, Cliff swallow, Barn swallow, chimney swift, Painted bunting, white-eyed vireo, lesser goldfinch, mourning dove, white-winged dove, great-tailed grackle, yellow-billed cuckoo, summer tanager, brown-headed cowbird, western scrub-jay,

Golden-cheeked Warbler Observations

Male #	Song Type	Female #	Juv #	Distance from Observer (feet)	Direction from Observer (degrees)	Time of Observation	Observation Type (Auditory or Visual)	Observation Mapped or GPS-recorded (Yes or No)

Additional Notes

Avian spp. observed cont: yellow-billed cuckoo, turkey vulture, red-tailed hawk, black-chinned hummingbird, blue grosbeak.

TECHNICAL MEMORANDUM

2010 Golden-cheeked Warbler Survey – Alamo Regional Mobility Authority's Proposed Improvements to US 281 from Loop 1604 to Borgfeld Road Bexar County, Texas

Prepared for

Jacobs and Alamo Regional Mobility Authority

Prepared by

Hicks & Company
1504 West 5th Street
Austin, Texas 78703

August 2010

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ENVIRONMENTAL
ARCHEOLOGICAL
AND PLANNING
CONSULTANTS

TECHNICAL MEMORANDUM

TO: **Ms. Allison Arnold, USFWS**

FROM: **John Kuhl, Hicks & Company**

DATE: **August 26, 2010**

RE: **2010 Golden-cheeked Warbler Survey – Alamo Regional Mobility Authority's Proposed Improvements to US 281 (Loop 1604 to Borgfeld Road – Bexar County, Texas)**

I. Introduction and Project Background

This memorandum documents the results of the second year of surveys for the federally and state listed endangered Golden-cheeked Warbler (*Dendroica chrysoparia*) (GCWA) within and adjacent to the project corridor for proposed improvements between Loop 1604 and Borgfeld Road along US 281 in Bexar County, Texas. This survey, conducted by Hicks & Company personnel, follows up a habitat assessment and survey conducted by Blanton & Associates, Inc. (B&A) during the previous breeding season (B&A, 2009). The habitat assessment and surveys have been coordinated with you and Alamo Regional Mobility Authority (Alamo RMA) during a field visit led by B&A on April 10, 2009 during the 2009 survey and again in an office meeting held at the Alamo RMA offices on January 22, 2010 prior to the 2010 survey. The habitat assessment and surveys were conducted on behalf of the Alamo Regional Mobility Authority (Alamo RMA) and, to date, have resulted in negative findings for GCWA presence.

The existing US 281 facility is a four to six lane divided arterial with partial access control in the 7.5-mile long project area (**Figure 1 in Attachment 1**). The San Antonio-Bexar County Metropolitan Planning Organization Mobility 2035 Plan envisions the future US 281 within the project limits as a six-lane toll facility; however, the Alamo RMA is currently studying a variety of possible improvement scenarios as a part of an Environmental Impact Statement (EIS). These surveys are intended to provide data to assess potential impacts the proposed US 281 project might have on this endangered songbird.

II. Methods

The primary pre-field preparation for this survey was a review of the survey report by B&A, review of pertinent GCWA localities mapped by the Texas Natural Diversity Database (TXNDD), recent aerial photography, topographic maps and field reconnaissance. Right of entry was requested for all parcels within the habitat blocks identified by B&A in the previous effort; however, slightly less property was available for survey this season due to right of entry denials

and habitat losses during the course of the past two survey seasons. Specific information regarding habitat assessment results are discussed in **Section III. GCWA Background Research and Habitat Assessment Results**.

Survey methods followed most recent U.S. Fish and Wildlife Service (USFWS) protocols outlined in *USFWS Section 10(a)(1)(A) Scientific Permit Requirements for Conducting Presence/Absence Surveys for Endangered Golden-cheeked Warblers* (see **Attachment 2**). A total of six surveys were conducted and playback tapes of both the A song and B song of the GCWA were played on the sixth visit. All avian and wildlife species encountered were documented, as were atmospheric conditions required in the USFWS protocol (range of air temperatures, wind direction and speed, cloud cover, and precipitation).

III. GCWA Background Research and Habitat Assessment Results

According to a Texas Parks and Wildlife Department Natural Diversity Database search (TXNDD) (TPWD, 2009) twenty-seven occurrences of the federally endangered GCWA have been recorded within 10 miles of the proposed project area. The closest occurrence was recorded in 2001 approximately 1.42 miles east of the proposed project area between Bulverde Road and the West Fork of Cibolo Creek.

More than half of the recorded occurrences for the GCWA were from approximately four to nine miles west and northwest of the proposed project area on Camp Bullis. Most of these recorded occurrences are from 1990-1992; however, to date, Camp Bullis has been conducting their own surveys for the warbler and the TXNDD dataset does not appear to include that data. Another TXNDD warbler occurrence was recorded in 2000 approximately 8.33 miles northwest of the proposed project area in the Guadalupe River State Park. The rest of the GCWA occurrences in the TXNDD dataset were recorded from 1990 to 2001 south/southwest of Camp Bullis, ranging four to ten miles away from the project area.

Personal communication with David Riskind, Natural Resources Program Director for TPWD Parks Division, on June 9, 2010 indicates that Guadalupe River State Park has approximately 200 acres of GCWA habitat and eight to ten GCWA pairs of and Honey Creek State Natural Area has approximately 450 acres of GCWA habitat and 15-20 GCWA pairs. These facilities are contiguous and roughly 6-8 miles northwest of the project area. The majority of this habitat and these GCWA localities at the park and natural area tend to be along the river and creek itself (Personal communication with Mark Lockwood, Natural Resource Program Biologist, TPWD Parks Division on June 16, 2010).

The habitat assessment conducted in Spring of 2009 by B&A originally delineated 13 blocks of potential habitat for the GCWA and determined no habitat was present for any other endangered songbirds; most notably the Black-capped Vireo (*Vireo atricapilla*). After survey, B&A recommended dismissing three of these blocks as they were determined, after further inspection, to not contain suitable habitat due to a variety of reasons. After aerial photo and field reconnaissance, Hicks & Company ecologists agreed with these conclusions and set about to closely follow B&A recommendations and generally mirror the efforts of the previous breeding season. As with the B&A effort, right of entry was not granted to all potential habitat, within the

project corridor and Ashe juniper clearing rendered some additional tracts non-habitat; however, surveys were conducted in representative samples within a majority of the blocks where habitat was still present. These circumstances are detailed below.

The habitat assessment conducted by B&A found no GCWA habitat in the existing US 281 right-of-way (ROW) but identified 13 blocks of potential GCWA habitat in either proposed ROW and/or a 500-foot wide corridor on either side of the proposed ROW. In their 2009 Survey report, B&A recommended the dismissal of Blocks 4, 10 and 11 due to residential and commercial development encroachment (Blocks 4 and 10, respectively) and Ashe juniper removal (Block 11). Hicks & Company ecologists similarly dismissed a portion of Block 6 and all of Block 12 due to habitat removal which occurred prior to the 2010 survey. In addition, ROE problems eliminated Blocks 3, 5 and 13 from direct survey in 2010. This season, a total of 18 properties within five of the 13 original habitat blocks were accessible (private property owners allowed entry) and still supported enough suitable habitat to warrant GCWA survey. The survey area within habitat blocks consisted of existing ROW, proposed ROW and a buffer area 500 feet outside the proposed ROW. The portions of habitat blocks where access was denied were indirectly surveyed to the extent practicable from US 281 ROW or adjacent public roadways. Access to the interior of the tracts away from the US 281 ROW was very valuable as traffic, construction and other ambient noise levels were worse adjacent to the roadway. **Table 1** below provides summary information regarding parcels, acreages and habitat suitability for each of the original 13 habitat blocks. **Figures 2-3.10** in **Attachment 1** illustrate the original GCWA habitat blocks delineated by B&A and the portions surveyed in 2010.

Table 1. US 281 (Borgfeld Road – Loop 1604) GCWA Habitat Block Summary – 2010 Survey

Habitat Block	# of Parcels Directly Surveyed	Acreage Directly Surveyed	Habitat Suitability/Disposition
1	2	15.86	Suitable for survey
2	2	14.14	Suitable for survey
3	0	0	No response to ROE letters
4	0	0	Dismissed by B&A (residential in nature)
5	0	0	No response and/or denial to ROE letters
6	2	11.78	13 acres dismissed by Hicks due to complete Ashe juniper removal; remainder suitable for survey
7	1	4.92	Suitable for survey
8	0	0	ROE problematic (late, conditional – unreasonable insurance requirements)
9	11	77.26	Suitable for survey but significant oak die-off occurring due to stress-induced Hypoxylon canker
10	0	0	Dismissed by B&A (surrounded by commercial development); No ROE granted
11	0	0	Dismissed by B&A (complete Ashe juniper removal); No ROE granted
12	0	0	42.43 acres dismissed by Hicks due to complete Ashe juniper removal
13	0	0	No response to ROE letters
Totals:	18	123.96	

IV. GCWA Survey Results

No GCWAs were detected by call or visual observation during the 2010 presence/absence survey. A total of 51 avian species in 29 families were detected and are documented by visit in **Attachment 3**. The most commonly observed species included Carolina Chickadee (*Poecile carolinensis*), Black-crested Titmouse (*Baeolophus bicolor*), Carolina Wren (*Thryothorus ludovisicanus*), Bewick's Wren (*Thryomanes bewickii*), Northern Mockingbird (*Mimus polyglottus*), Rufous-crowned Sparrow (*Aimophila ruficeps*), Northern Cardinal (*Cardinalis cardinalis*), Brown-headed Cowbird (*Molothrus ater*), and Lesser Goldfinch (*Carduelis psaltria*). Each of these species was observed on all six survey visits. Other wildlife observed included white-tailed deer (*Odocoileus virginianus*), cottontail (*Sylvilagus floridanus*), grey fox (*Urocyon cinereoargentus*), Rio Grande leopard frog (*Rana berlandieri*), and American bullfrog (*Rana catesbeiana*) tadpoles. Field data sheets documenting conditions and observations during the presence/absence survey are included in **Attachment 4**.

IV. Summary/Discussion

A rigorous direct presence/absence survey for the GCWA was conducted on approximately 124 acres in Blocks 1,2,6,7 and 9, and surveyors checked all additional habitat available from public rights of way during the effort. After two breeding seasons of presence/absence survey, no GCWA have been detected and habitat quantity and quality losses continue due to current and pending development and both man-induced and natural woodland losses in the corridor. Ashe juniper clearing has taken place in Blocks 6,11 and 12 and significant oak mortality has been observed on the west side of US 281 due to *Hypoxylon* canker; a naturally occurring fungal condition particularly expressed in oaks during periods of environmental stress (Personal communication with Mark Duff, Texas Forest Service on May 27, 2010). In addition, nesting deterrents for the GCWA are prevalent and likely increasing due to urbanization, noise, and the constant presence of typical nest predator and social parasite species such as the Western Scrub Jay, Great-tailed Grackle and Brown-headed Cowbird. Given the negative survey findings to date and increasing downward spiral of habitat quantity and quality, it does not seem likely that the GCWA will utilize the project corridor.

LITERATURE CITED

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Pyle, Peter and D.F. DeSante. 2010. Four-letter (English name) and six-letter (scientific name) alpha codes for 2055 bird species (and 97 non-species taxa). The Institute for Bird Populations. http://www.birdpop.org/DownloadDocuments/Alpha_codes_tax.pdf

Texas Parks & Wildlife Department. 2009. Texas natural diversity database query accessed December 23, 2009.

ATTACHMENT 1

Figures

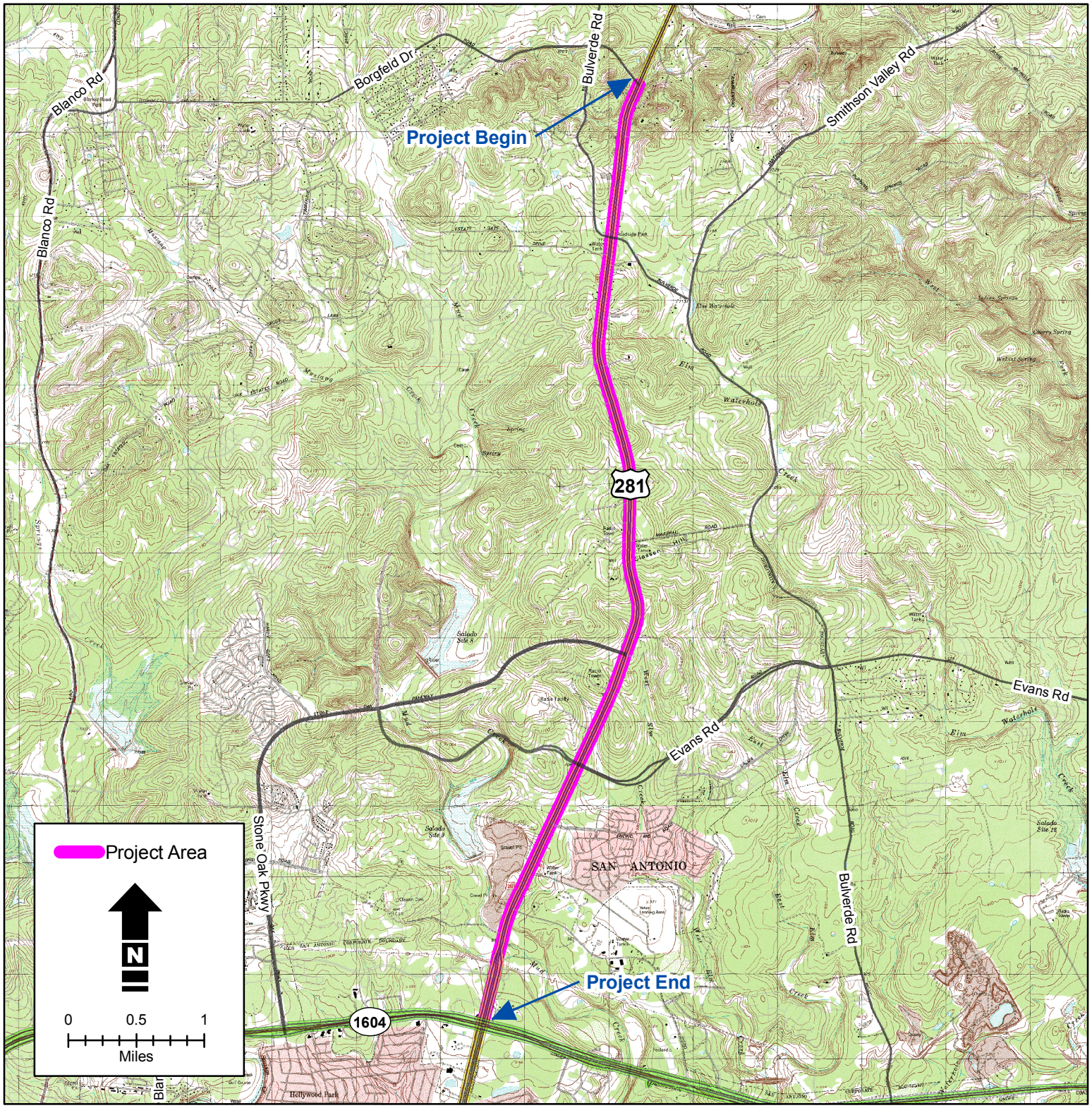
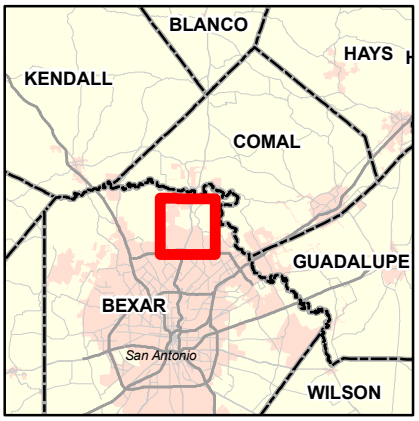
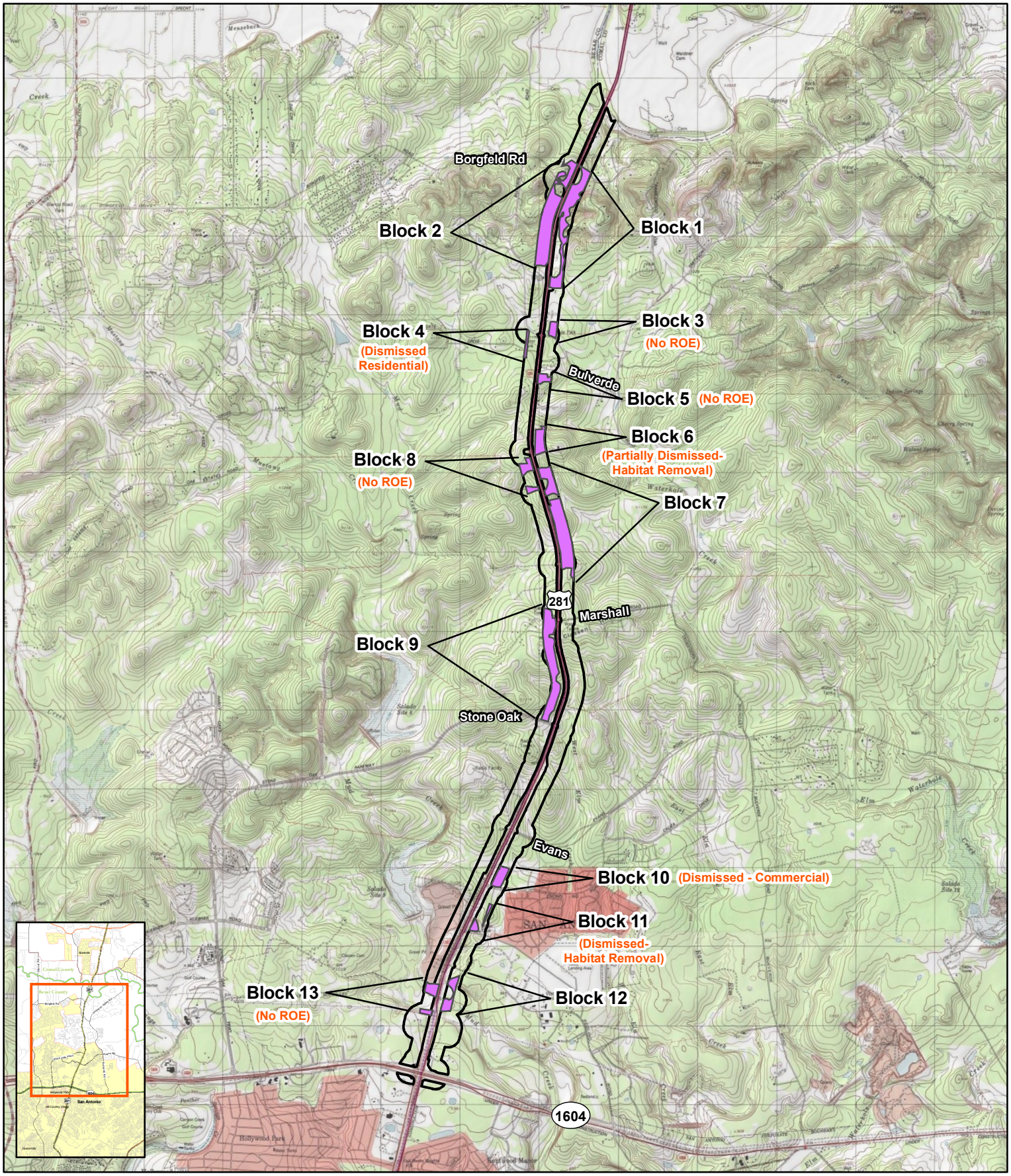


Figure 1
Project Location
US 281 From Loop 1604 to Borgfeld Road
Bexar County, TX

USGS 7.5-minute Topographic Quadrangles:
Bulverde, Longhorn, Camp Bullis & Castle Hills, Tx





N

0 0.5 1
Miles

1 inch equals 1 mile

Figure 2

US 281 From Loop 1604 to Borgfeld Road
Potential GCWA Habitat Blocks
on Topographic Base

Key to Features

- Study Area (500 ft. Buffer from Existing ROW)
- Golden-cheeked Warbler Habitat Blocks

Base Map: USGS 7.5 Minute Quadrangles : Bulverde, Longhorn, Camp Bullis & Castle Hills, Tx